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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/884,287	06/19/2001	Tsuei-Chi Yeh	B-4218 618886-4	3907

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EXAMINER	
VO, HUYEN X	

ART UNIT	PAPER NUMBER
2655	7

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/884,287	YEH ET AL.	
	Examiner	Art Unit	
	Huyen Vo	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *3/2/2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the office action from 11/17/2003, the applicant has submitted an amendment, filed 3/2/2004, amending claims 1 and 6, while arguing to traverse the art rejection based on the amended limitation regarding a "*summing the computed distance*" and "*each of the elements in the speech features and the reference template is a binary number*" (*Amendment page 2 and 4*).

Applicant's arguments have been considered but are moot in view of the new grounds of rejection, necessitated by the amended claims, and based on Higgins (US Patent No. 5339385).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Higgins (US. Patent. No. 5,339,385).

1. Regarding claim 1, Higgins discloses a method for identifying an authorized user using a spectrogram includes the steps of:

1. Detecting an end point of a speech after a user speaks (col. 5, ln. 36-37).

2. Extracting speech features from a spectrogram of the speech (col. 5, ln. 13-19).

3. Determining whether training is necessary, and, if so, taking the speech features as a reference template, setting a threshold (col. 6, ln. 63-65) and going back to step 1, otherwise, proceeding to the next step (col. 5, ln. 51-54).

4. Matching patterns of the speech features and the reference template (col. 6, ln. 20-21).

5. Computing a distance of each element between the speech features and the reference template according to a matching result of step 4, and summing the computed distance to obtain a distance scoring (col. 6, equations 1a-b and 2, *equation 2 teaches the average distance which is calculated by summing an N distance scores and then divided by N*); wherein each of the elements in the speech features and the reference template is a binary number (col. 5, ln. 4-33, *the operation of the speaker verification apparatus disclosed by Higgins is performed in a digital system. Thus, the speech features and reference templates must be represented by binary numbers*).

6. Comparing the distance scoring with the threshold (col. 7, ln. 63-66).

7. Determining whether the user is authorized according to a compared result of step 6 (col. 7, ln. 66-68).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins (US. Patent No. 5,339,385) in view of Princen (IEEE Transactions on Signal Processing, vol. 43, No. 11, November 1995).

2. Regarding claim 3, Higgins discloses all the limitations of claim 3 in accordance with claim 1, but fails to specifically disclose a method wherein the speech features are retrieved by using a Princen-Bradley filter bank to transform the detected speech signal to obtain a corresponding spectrogram. However, Princen teaches the method wherein the speech features are retrieved by using a Princen-Bradley filter bank to transform the detected speech signal to obtain a corresponding spectrogram (figures 1 and 2, filter response is shown on figures 6 and 7).

Since Higgins and Princen are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Higgins by incorporating a Princen-Bradley filter bank as taught by Princen in order to accurately construct the spectrogram of the input speech.

Claims 2 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins (US. Patent No. 5,339,385) in view of Chen (US. Patent. No. 6,314,395).

Regarding claim 2, Higgin discloses a method as claimed in claim 1 wherein the detection of the end point of the speech in (i) (col. 5, ln. 36-37) and (ii) converting analog speech signals to digital speech signals by an A/D converter (col. 5, ln. 1-11), but fails to specifically disclose the steps of:

(i) filtering the speech with a low-pass filter;

(iii) pre-emphasizing the digital speech signals to thoroughly model lower-amplitude and higher-frequency parts of the speech;

(iv) extracting a majority magnitude for each frame; and

(v) comparing the majority magnitude of each frame with the threshold to determine a begin point and an end point of the speech.

However, Chen teaches step (i) (10 of figure 1), step (iii) (30 of figure 1), step (iv) (col. 6, ln. 10-15), and step (v) (col. 6, ln. 19-21). The advantage of incorporating the steps taught by Chen into Higgins is to accurately detect the voice and unvoiced sections of the speech.

Since Higgins and Chen are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Higgins by incorporating the steps taught by Chen in order to accurately detect the begin- and end-points of

speech words to increase reliabilities of the voice recognition system embedded in the user authorization system.

3. Regarding claim 4, the combination of Higgins and Chen in accordance with claim 2 discloses all the limitations of claim 4, but fails to specifically disclose the majority magnitude is obtained by counting the total number of each absolute amplitude level, and the great majority of the absolute amplitude levels is defined as the majority magnitude of the current frame. However, Chen further teaches the majority magnitude is obtained by counting the total number of each absolute amplitude level (col. 8, ln. 60-64), and the great majority of the absolute amplitude levels is defined as the majority magnitude of the current frame (col. 6, ln. 48-50). The advantage of using the method of counting the majority magnitude, as taught by Chen, is to accurately detect the begin- and end-points of the speech word.

Since Higgins and Chen are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Higgins by incorporating the method of counting the majority magnitude as taught by Chen in order to accurately determine the begin- and end-points of speech words to increase reliabilities of the voice recognition system embedded in the user authorization system.

4. Regarding claim 5, the combination of Higgins and Chen in accordance with claim 2 discloses all the limitations of claim 5, but fails to specifically disclose the process of determining the begin point and the end point of the speech in the step (v) includes the steps of:

(i) setting a threshold;

(ii) determining whether the detection of the begin point is beginning, if yes going to step (iv), otherwise going to next step;

(iii) determining whether the majority magnitudes of three adjacent frames are all larger than the threshold, if not, then changing the threshold and going on to the measurement of the next majority magnitude and going back to step (ii), otherwise the beginning point having been detected, going on to the measurement of the next majority magnitude and going back to step (ii);

(iv) delaying a period of time;

(v) determining whether the majority magnitudes of three adjacent frames are all smaller than the threshold, and, if not, going on the measurement of the next majority magnitude and going back to step (v), otherwise the end point has been detected.

However, Chen further teaches step (i) (410 of figure 4), step (ii) (420 of figure 4), step (iii) (421-425 of figure 4), step (iv) (430 of figure 4), and step (v) (440 of figure 4). The advantage of using the steps as taught by Chen is to make sure that the actual begin- and end-points of a speech word are detected to increase reliabilities of the voice recognition unit embedded in the user authorization system.

Since Higgins and Chen are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Higgins by incorporating the steps as taught by Chen in order to make sure that the actual begin- and end-points of the speech word are detected to increase reliabilities of the voice recognition unit embedded in the user authorization system.

5. Regarding claim 6, Higgins discloses an apparatus for identifying an authorized user by using spectrograms (figure 1) comprising:

an A/D converter for converting analog speech signals to digital speech signals (col. 5, ln. 9-11).

a digital signal processor for receiving digital speech signals from the A/D converter and performing operations in each step of the method as claimed in claim 1; (elements 5-7 of figure 1, the combination of these elements can be considered as a digital signal processor) and

a memory device for storing data of a threshold and a reference template which are required in the operations of the digital signal processor, wherein each element of the reference template is a binary number (col. 7, ln. 33-40, *the operation of the speaker verification apparatus disclosed by Higgins is performed in a digital system. Thus, the speech features and reference templates must be represented by binary numbers*).

Higgins fails to specifically disclose a low-pass filter for limiting the frequency range of submitted speech. However, Chen teaches a low-pass filter

for limiting the frequency range of submitted speech (10 of figure 1). The advantage of using a low-pass filter as taught by Chen is to eliminate the unwanted high frequency noise.

Since Higgins and Chen are analogous art because they are from the same field of endeavors, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Higgins by incorporating a low-pass filter as taught by Chen in order to remove unwanted high frequency noise from the signal.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Honda (US. Patent No. 5,293,448) teaches a speech analysis method for detecting voice and un-voice speech signal that is considered pertinent to the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huyen Vo whose email address is huyen.vo@uspto.gov. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703-305-4827. The fax phone number for the organization where this application or proceeding is assigned is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Examiner: Huyen X. Vo

April 30, 2004

DORIS H. TO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600